

**REMARKS**

In response to the various paragraphs of the Office Action, applicants offer the following remarks.

**Drawings:**

The features of "a dielectric member having a via hole and the side member including the via hole" is shown, for example, in Fig. 15. As shown, conductive bars 32 are formed in via holes along the sides of dielectric member 31. This is also discussed in the specification at page 46, lines 11-24.

Please approve the addition of new Figures 60a, 60b and 60c, attached to this Response. These figures reflect the discussion in the specification at page 105, lines 13-20, and are further discussed below. Applicants respectfully submit that these figures are not new matter.

**Section 102 Rejections**

Claims 5-8 and 10 have been rejected as being anticipated by Bogner. The Applicants respectfully submit that this rejection is overcome for reasons set forth below. (Claim 5 has been cancelled.)

**Amended claim 6**

The Applicants' invention, as recited in amended claim 6 includes features which are not anticipated or suggested by Bogner, namely:

**the conductive member extends its entire length  
normally of the conductive bottom member and  
the ceiling member.**

This feature is shown, for example, in Fig. 1(B). As shown, conductive member 13 extends its entire length normally of conductive bottom member 11 and ceiling member 15.

Bogner, on the other hand, shows conductive member 22 in Figs. 2 and 3, and conductive member 15 in Fig. 1. Bogner's conductive member does not extend normally along their entire length, between respective bottom members and ceiling members. Bogner is thus different from amended claim 6.

Claims 7-9, each depend from claim 6 and are, therefore, distinguishable from Bogner for at least the same reasons set forth for claim 6.

Amended claim 10

Claim 10 has been amended to include the following feature:

**at least one of the bottom member and the side member has an opening other than an opening for the signal line.**

This feature is discussed in the Specification, for example, at page 105, lines 13-20, as follows:

"In the antenna devices of the ninth to fourteenth embodiments, the openings formed by the ceiling conductor 117 are arranged in an antenna ceiling portion; however, the present invention is not restricted to this structure. For example, in order to achieve desired radiation directivity or input impedance characteristics, the openings can be arranged on the side conductor or on the ground conductor, or these structures can be combined." (emphasis added).

An example of openings on the side conductor is shown in newly added Fig. 60a. As shown, openings 118a and 118b are included on side conductor 113. Another perspective view of the openings on the side conductor is shown in Fig. 60b. It will be appreciated that Fig. 60a and Fig. 60b show substantially the same structure. Fig. 60a shows the structure when viewed looking down; Fig. 60b shows the same structure when viewed looking up, thereby exposing bottom conductor 111.

Another example of openings on the side conductor is shown in newly added Fig. 60c. As shown, opening 118c is on side conductor 113.

Bogner, on the other hand, shows in Figs. 1-3, an opening on the bottom conductor to accommodate signal line 16. Bogner does not disclose or suggest an antenna having, in the bottom member or the side member, an opening **other than an opening for the signal line**. Bogner is thus different from amended claim 10.

### **Section 103 Rejections**

#### **Amended claim 22**

Claim 22 has been rejected as being obvious in view of Bogner. Applicants respectfully submit that the rejection is overcome for reasons set forth below.

The applicants' invention, as recited in amended claim 22, includes features which are not anticipated or suggested by Bogner, namely:

an arrangement method of antennas,

each antenna including a conductive bottom member, a conductive side member, a conductive member arranged

in a space surrounded by the bottom member and the side member, wherein the conductive member is connected to a signal line for transmission and/or reception, and

a conductive ceiling member covering all or part of the space, and the conductive member extending its entire length normally of the conductive bottom member and the ceiling member,

the method comprising...

As amended, the method of the invention includes aligning and arranging plural antennas, where **each antenna includes the same structure as the structure of amended claim 6**. Amended claim 22 is now distinguished from Bogner for at least the same reasons set forth above with respect to amended claim 6.

Claim 9 depends from claim 6 and is, therefore, patentable for at least the same reasons set forth above with respect to amended claim 6.

Amended claim 15

Claim 15 has been rejected as being obvious in view of Bogner and Sanford. Applicants respectfully submit that this rejection is overcome for reasons set forth below.

The applicants' invention, as recited in amended claim 15, includes features which are not anticipated or suggested by the cited references, namely:

**a conductive ceiling member covering a part of the space, and covering only a portion of the dielectric member.**

This feature is shown, for example, in Figs. 11(A) and 11(B), in which conductive ceiling member 15 covers part of the space and **covers only a portion of dielectric member 31**. As described in the specification, at page 41, lines 11-15, the space inside the antenna, formed by ground conductor 11 and side conductor 14, is filled with dielectric member 31. **Conductive ceiling member 15 covers only a portion of dielectric member 31.**

Bogner, on the other hand, does not suggest a dielectric member disposed inside the space of an antenna (as admitted in the Office Action).

Sanford discloses in Fig. 2 dielectric member 11 disposed inside space 14 of an antenna. Sanford also discloses ceiling member 12 covering all of space 14 and covering all of dielectric member 11. Sanford, however, does not disclose or suggest a conductive ceiling member that covers a part of the space and covers only a portion of the dielectric member. Sanford is thus also different from amended claim 15.

Claims 16-17 depend from claim 15 and are, therefore, patentable for at least the same reasons set forth for amended claim 15.

Claim 41 depends from claim 6 and is, therefore, patentable for at least the same reasons set forth for amended claim 6.

#### **Allowable Subject Matter**

Claims 4, 19-21 and 23-40 are allowed.

B

Claims 11-14, 18, 42 and 43 were objected to as being dependent upon rejected base claims.

Claims 11, 18, 42 and 43 have now been amended to include the features of their rejected base claims. Claims 11, 18, 42 and 43 are now in condition for allowance.

Claims 12-14 which depend from amended claim 11 (claim 12 also depends from amended claim 10) are also in condition for allowance.

Claims 42-43, which depend from amended claim 6, are also in condition for allowance.

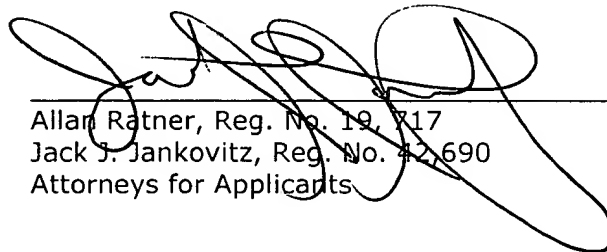
**CONCLUSION**

Claim 5 has been cancelled.

Claims 4, 19-21 and 23-40 are allowed.

Claims 6-18, 22, and 41-43 are in condition for allowance.

Respectfully Submitted,



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Enclosure:

Version with markings to show changes made  
Figs. 60a-c

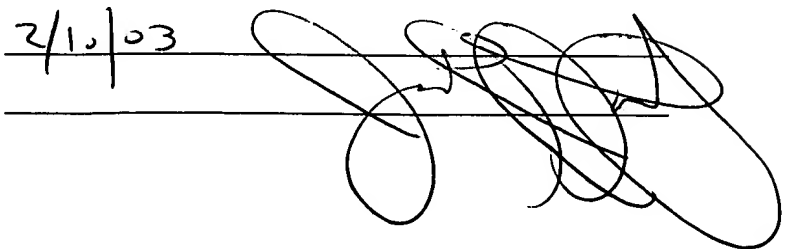
Dated: February 10, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

SPECIFICATION:

Specification at page 23, line 18:

Figs. 60 a-c are perspective views showing other examples of the present invention.

CLAIMS:

Please cancel claim 5.

Please amend the following:

6. (Twice Amended) An antenna comprising:

a conductive bottom member;

a conductive side member; and

a conductive member arranged in a space surrounded by the bottom member and the side member, wherein the conductive member is connected to a signal line for transmission and/or reception; and

a conductive ceiling member covering all or part of the space,

wherein the conductive member extends its entire length normally of the conductive bottom member and the ceiling member.

10. (Twice Amended) An antenna comprising:

a conductive bottom member;

a conductive side member; and

a conductive member arranged in a space surrounded by the bottom member and the side member,



wherein the conductive member is connected to a signal line for transmission and/or reception, and

at least one of the bottom member and the side member [have] has an opening[s] other than an opening for the signal line.

11. (Amended) [The] An antenna comprising: [according to claim 6,]

a conductive bottom member;

a conductive side member;

a conductive member arranged in a space surrounded by the bottom member and the side member,

wherein the conductive member is connected to a signal line for transmission and/or reception; and

a conductive ceiling member covering all or part of the space,

wherein the ceiling member has openings.

15. (Twice Amended) An antenna comprising:

a conductive bottom member;

a conductive side member; and

a conductive member arranged in a space surrounded by the bottom member and the side member,

wherein the conductive member is connected to a signal line for transmission and/or reception; [and]

a dielectric member that has a permittivity higher than air is provided in the space; and

a conductive ceiling member covering a part of the space, and covering only a portion of the dielectric member.

18. (Amended) [The] An antenna [according to claim 17,]  
comprising:

a conductive bottom member;

a conductive side member;

a conductive member arranged in a space surrounded by the bottom member and the side member,

wherein the conductive member is connected to a signal line for transmission and/or reception;

a conductive ceiling member covering all or part of the space; and

a dielectric member having a permittivity higher than air provided in the space,

wherein the dielectric member has a via hole, and the side member includes [consists of] the via hole.

22. (Twice Amended) An arrangement method of antennas, each antenna including a conductive bottom member, a conductive side member, [and] a conductive member arranged in a space surrounded by the bottom member and the side member, wherein the conductive member is connected to a signal line for transmission and/or reception, and

a conductive ceiling member covering all or part of the space, and the conductive member extending its entire length normally of the conductive bottom member and the ceiling member,

the method comprising a step of aligning and arranging the plural antennas in a manner to produce a direction for minimizing directivity of each of the antennas on a horizontal plane.

42. (Amended) [The] An antenna comprising:

a conductive bottom member;

a conductive side member;

a conductive member arranged in a space surrounded by the bottom member and the side member,

wherein the conductive member is connected to a signal line for transmission and/or reception;

a conductive ceiling member covering all or part of the space; and

[according to claim 6, including] at least one matching element which is arranged apart by a predetermined distance from the conductive member, wherein the matching element and the bottom member are connected to each other electrically.

43. (Amended) [The] An antenna comprising:

a conductive bottom member;

a conductive side member;

a conductive member arranged in a space surrounded by the bottom member and the side member,

wherein the conductive member is connected to a signal line for transmission and/or reception;

a conductive ceiling member covering all or part of the space; and

[according to claim 6, including] a circuit for transmission and/or reception connected to the signal line and arranged in the space.